Computer games help explain lizard stripes

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Goldteju Tupinambis teguixin. Credit: Wikipedia/CC BY-SA 3.0

(Phys.org)—A pair of researchers with the Indian Institute of Science Education and Research Thiruvananthapuram has found that stripes on lizards cause predators to see them as moving slower than they actually are, causing attackers to miss their targets. In their paper published in the journal *Royal Society Open Science*, Gopal Murali and Ullasa

Kodandaramaiah discuss their theories on why some animals have stripes, their experiments with grad students playing specially designed computer games and what they found as a result.

Many people have wondered over many years why it is that some animals have stripes—some have suggested they serve as camouflage, while others have theorized that the patterns cause confusion in the eyes of predators—stripes on zebras, for example, might perhaps cause lions to have trouble fixating on just one member of a herd. In this new effort, the research pair focused specifically on lizards, but rather than use live ones, they created virtual ones on computer screens. And rather than use real predators, they used grad students who were asked to "catch" the lizards, by simply clicking on their bodies. But, there was a catch, some of the lizards had stripes on their bodies similar to those on real lizards, while others had stripes only on their tails. In analyzing the results of play, the researchers found that the grad students were 25 percent less accurate in clicking on the bodies of the lizards when the body was striped.

In another test, the researchers asked the student volunteers to simply report which of two lizards on a computer screen was moving faster than the other. In this test, some of the lizards had stripes while others were spotted. If a volunteer reported that one was faster than the other, than the speed of that lizard was slowed down al little bit—this routine continued until the volunteer reported that the lizards were moving at the same speed. In analyzing the results of multiple tests with multiple volunteers, the researchers found that the striped lizards were actually moving 5 percent faster on average than the spotted lizards at the end of the game.

The researchers suggest their experiments show that stripes on lizards in the real world might cause predators to misjudge the speed of their prey, leaving them grabbing a tail that simply falls away as the lizard escapes.

More information: Gopal Murali et al. Deceived by stripes: conspicuous patterning on vital anterior body parts can redirect predatory strikes to expendable posterior organs, *Royal Society Open Science* (2016). DOI: 10.1098/rsos.160057

Abstract

Conspicuous coloration, which presumably makes prey more visible to predators, has intrigued researchers for long. Contrastingly coloured, conspicuous striped patterns are common among lizards and other animals, but their function is not well known. We propose and test a novel hypothesis, the 'redirection hypothesis', wherein longitudinal striped patterns, such as those found on the anterior body parts of most lacertilians, redirect attacks away from themselves during motion towards less vulnerable posterior parts, for example, the autotomous tail. In experiments employing human 'predators' attacking virtual prey on a touchscreen, we show that longitudinal striped patterns on the anterior half of prey decreased attacks to the anterior and increased attacks to the posterior. The position of stripes mattered—they worked best when they were at the anterior. By employing an adaptive psychophysical procedure, we show that prey with striped patterning are perceived to move slower, offering a mechanistic explanation for the redirective effect. In summary, our results suggest that the presence of stripes on the body (i.e. head and trunk) of lizards in combination with caudal autotomy can work as an effective anti-predator strategy during motion.